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Via Facsimile & U. S. Mail
CAY1299/445 WBS 48

December 17, 1999

Mr. Gerald J. Thibeault
Executive Officer
California Regional Water Quality Control Board
Santa Ana Region
3737 Main Street, Suite 500
Riverside, California 92501-3339

**Subject: Quarterly Report – September through November 1999
Cleanup and Abatement Order No. 97-58
Order Item 1
Lockheed Martin Corporation**

Dear Mr. Thibeault:

This Report covers activity for the months of September, October, and November 1999. The report is submitted in accordance with Board Order No. 97-58 and the approved 15 August 1997 Work Plan and Schedule.

1.0 Perchlorate Sampling

Technical data on perchlorate, associated with the regular Water Supply Contingency Policy sampling, was submitted to the RWQCB under separate cover in September, October and November, 1999. The reports are entitled, "Production Well Sampling Report, Water Supply Contingency Plan, Crafton-Redlands Plume Project."

2.0 Modeling of Perchlorate Migration and Potential Impacts

Updated forecasts of perchlorate concentrations are scheduled for submittal to the Regional Board in December 1999 or January 2000. The revised numerical model incorporates updates to basin hydrostratigraphy, plume initial conditions, and projections of flow for various new and existing Bunker Hill Basin wells.

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3.0 Treatment Technology Applicability Review

This update presents recent developments in treatment technology research.

3.1 Perchlorate Treatment Technology Update

This update is divided into two parts: on-going research efforts sponsored by Lockheed Martin, and highlights of research efforts by other groups such as technology companies, public agencies and universities.

3.1.1 Testing Sponsored by Lockheed Martin

Lockheed Martin is continuing to conduct research on various ion exchange process options. This research will include upcoming field tests near a Gage Canal Company well (known as "Gage New 6") of different resins that could be used in a fixed bed treatment approach.

3.1.2 Testing Sponsored by Other Groups

Pilot Tests of the Calgon ISEP System

Calgon has announced a contract with the La Puente Valley County Water District to install a 2,500 gpm ISEP system to remove perchlorate from a water supply well with 50 ppb to 100 ppb perchlorate concentrations. Treated water from the full-scale system will be discharged to spreading basins for an extended period of time until the Department of Health Services grants a permit and allows the treated water to be distributed into a drinking water system.

Biological Treatment Testing Sponsored by Aerojet

Aerojet is negotiating with the City of La Puente to pilot test the biological treatment process at this site. This work is being done in conjunction with the Baldwin Park Operable Unit Steering Committee and the Main San Gabriel Basin Watermaster. Please note that additional process steps would be required following the biological process in applications where the treated water is used directly for drinking water. These processes could include multi-media filters and granular activated carbon.

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American Water Works Association Research Foundation (AWWARF) - Perchlorate Research Projects

Eight perchlorate related research contracts were awarded by AWWARF in 1998. The principle investigators for these projects submitted quarterly reports to the AWWARF in July 1999, however, these reports are not available to the public at this time. The research includes investigation of perchlorate removal/destruction by biological means, ion exchange, reverse osmosis and nanofiltration. Six of the eight research teams will be presenting papers on their projects as part of the AWWA Inorganics conference to be held in February 2000. New information (when available) on these studies is posted by AWWARF at their website: <http://www.awwarf.com/>.

American Chemical Society Symposium

The 218th American Chemical Society (ACS) National Meeting occurred on August 22-26, 1999, in New Orleans. Under direction from the EPA, all the papers presented at the conference on perchlorate will be published in a book. An advance order-offer for the book was published by the ACS in December 1999. The ACS says shipment of the book is expected in "mid-2000."

4.0 Water Supply Contingency Options

4.1 City of Riverside

The City of Riverside continues to blend perchlorate to levels below the provisional action level.

4.2 City of Loma Linda

Lockheed Martin is in the process of installing up to three new production wells for the City of Loma Linda to avoid the perchlorate plume. The first well, designated as COLL Mountain View #3, is located on the same City property as former COLL Mountain View #1 production well (now abandoned). Mountain View #3 has been installed to a total depth of 1,590 feet below ground surface (ft-bgs), and has been equipped for temporary use with the refurbished pump that was removed from Mountain View #1. A permit application for use of the well was submitted to the California Department of Health Services (DHS) and was approved on October 28, 1999. Mountain View #3 began pumping to the COLL water distribution system on November 2, 1999.

The second of the new production wells is designated as COLL Richardson #4 and is located on Gould Street approximately 400 feet west of Richardson Street on property currently owned by the City of San Bernardino. Transfer of this property to the COLL is in progress. Richardson #4

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has been installed to a total depth of 1,475 ft-bgs and has undergone mechanical development. As of the end of this reporting period, the pump and associated piping is being installed for pump development of Richardson #4.

The third new production well to be installed for the COLL is designated as Mountain View #4. This well site is located on a parcel of private property where a previous test borehole was drilled. The results of the test borehole indicated favorable groundwater production from the deep aquifer. An agreement for sale of the property was reached with the landowner and the COLL is in the process of acquiring title. A California Environmental Quality Act (CEQA) clearance was obtained for the Mountain View #4 site; and the DHS approved the well site after being provided with a Sanitary Survey Report and a conceptual well design. Approval was also obtained from the California Department of Transportation (CalTrans) for the Mountain View #4 pipeline easement across CalTrans property, and a tie-in of the Mountain View #4 bypass discharge system to an existing CalTrans drainage channel. The surface casing has been installed at the Mountain View #4 well site and the drilling of the well borehole and well construction will occur during the next quarterly reporting period.

Lockheed Martin continues to support the City of Loma Linda staff in developing blending plans to keep the perchlorate concentration below the provisional action level. COLL Mountain View #2 production well has been operating under a blending plan since November 1998. A blending plan for COLL Richardson #2 production well was approved by DHS on May 18, 1999, and was implemented on June 28, 1999.

Connections to the adjacent water distribution systems of the City of Redlands (COR) and Loma Linda University (LLU) are being pursued as contingency water supply sources, should the COLL system be unable to meet peak water demand before the new production wells come online. A connection to the City of San Bernardino (COSB) water system already exists and COLL and COSB have a water transfer agreement. A connection to LLU also currently exists. However, sampling and analysis of the LLU wells was required, and performed, as part of the application to the DHS to allow the water transfer to occur. The DHS approved the application on September 3, 1999, to allow the connection to be flow tested. For operational reasons, that flow test was not been performed as of the end of this reporting period, but is planned to occur in January 2000. If the flow test of the connection is successful, a water transfer agreement between the COLL and LLU will be negotiated. Construction began on the connection to the COR water system during this reporting period. This connection design was previously approved by the technical staff of the COLL and the COR. Also, the City Councils of COLL and COR have approved the connection construction and have negotiated and approved a water transfer agreement. We expect construction to be completed early in the next quarterly reporting period.

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4.3 Victoria Farms

Lockheed Martin continues to negotiate with Victoria Farms to resolve issues relating to the draft (July 1997) Water Supply Contingency Agreement. Victoria Farms currently receives water from the City of San Bernardino under a temporary water supply agreement. Lockheed Martin is reimbursing Victoria Farms for the incremental cost of the imported water.

4.4 City of Redlands

The City of Redlands is avoiding perchlorate through the active management of their surface water and groundwater resources. During this reporting period, Lockheed Martin and the City of Redlands came to terms on past TCE and perchlorate response costs submitted by the City of Redlands.

4.5 Mountain View Power Company (formerly Southern California Edison)

No perchlorate has been detected in the Mountain View Power Company wells. The Mountain View Power Company plans to increase pumping at wells SCE Nos. 1 and 2 for cooling water purposes.

4.6 Loma Linda University

No Perchlorate was detected above the provisional action level in the Loma Linda University wells.

5.0 Perchlorate Study Group

The Perchlorate Study Group (PSG) continues to provide financial support for ongoing toxicology research on perchlorate. As they are completed, the results of these studies are being forwarded to the Interagency Perchlorate Steering Committee, which includes members from the U.S. EPA and California EPA.

In cooperation with the PSG, the U.S. EPA, and the United States Air Force, Lockheed Martin has coordinated a multiple lab test of numerous chemical fertilizers for the presence of perchlorate in 1999. The USAF is taking the lead in the publishing of this report.

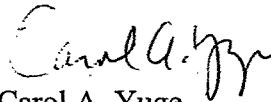
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We understand that the U.S. EPA's draft "Reference Dose" (RfD) for perchlorate (published in December 1998) will be assessed in a second external peer review sometime in the fall of 2000. The U.S. EPA is currently expecting toxicological results from several new studies to determine if the draft RfD (equivalent to 32 ppb in water) should be finalized or revised.

6.0 Closing

The next quarterly update will be submitted on or about March 15, 2000. If you have any questions, please contact me at (818) 847-0197 or Mr. Tom Blackman at (818) 847-0791.

Sincerely,



Carol A. Yuge

cc: See attached distribution list

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